

WHAT IS CLAIMED IS:

1. A method of treating the spine, comprising the steps of:
identifying a site on the anterior surface of the sacrum;
forming a lumen from the site through the sacrum, through a disk and
5 into at least one vertebrae; and
performing a procedure using the lumen.
2. A method of treating the spine as in Claim 1, wherein the procedure is a
600 diagnostic procedure.
3. A method of treating the spine as in Claim 1, wherein the procedure is a
10 604 therapeutic procedure.
4. A method of treating the spine as in Claim 3, wherein the lumen extends
at least as far as the L4 vertebrae.
5. A method of treating the spine as in Claim 4, wherein the lumen is linear.
- 606 6. A method of treating the spine as in Claim 1, wherein the forming step
15 comprises drilling.
7. A method of treating the spine as in Claim 3, wherein the procedure
comprises removing at least a part of a disk.
8. A method of treating the spine as in Claim 3, wherein the procedure
comprises removing an entire nucleus.
- 20 9. A method of treating the spine as in Claim 3, wherein the procedure
comprises inserting a fixation device.
- 608 10. A method of treating the spine as in Claim 3, wherein the procedure
comprises introducing a bone growth facilitator.
- 25 11. A method of treating the spine, comprising the steps of:
identifying a site on the posterior surface of the sacrum;
forming a nonlinear lumen from the site through the sacrum, through a
disk and through at least one lumbar vertebrae; and
performing a procedure using the lumen.
- 30 12. A method of treating the spine as in Claim 11, wherein the procedure is a
diagnostic procedure.

13. A method of treating the spine as in Claim 11, wherein the procedure is a therapeutic procedure.

14. A method of treating the spine as in Claim 13, wherein the lumen extends at least as far as the L4 vertebrae.

5 15. A method of treating the spine as in Claim 11, wherein the forming step comprises drilling.

16. A method of treating the spine as in Claim 13, wherein the procedure comprises removing at least a part of a disk.

10 17. A method of treating the spine as in Claim 13, wherein the procedure comprises removing an entire nucleus.

18. A method of treating the spine as in Claim 13, wherein the procedure comprises inserting a fixation device.

11 23 19. A method of treating the spine as in Claim 13, wherein the procedure comprises introducing a bone growth facilitator.

15 20. A method of treating the spine, comprising the steps of:
identifying a site on the skin of a patient, within about 5 cm from the coccyx;
providing a percutaneous access at the site and through tissue to the sacrum;
20 creating a lumen through the sacrum and at least one lumbar vertebrae;
and
using the lumen to perform a procedure.

21. A method of treating the spine as in Claim 20, wherein the lumen is at least about 5 cm in length.


25 22. A method of treating the spine as in Claim 21, wherein the lumen is at least about 10 cm in length.

23. A method of treating the spine as in Claim 20, wherein the lumen is linear.

30 24. A method of treating the spine as in Claim 20, wherein the lumen is curved.

25. A method of treating the spine as in Claim 20, wherein the lumen extends at least as far as the thoracic spine.

26. A method of treating the spine at a treatment site which is spaced apart from an access site, comprising the steps of:

- 5 identifying an access site on the spine;
advancing a device through the access site and into the spine;
further advancing the device axially through the spine for a distance across a treatment zone; and
10  treating the spine in the treatment zone;
wherein the distance is at least about 5 cm.

27. A method of treating the spine as in Claim 26, wherein the distance is at least about 10 cm.

28. A method of treating the spine as in Claim 26, wherein the access site is on the sacrum.

15 29. A method of treating the spine as in Claim 26, wherein the access site is on the thoracic spine.

30. A method of treating the spine as in Claim 26, further comprising the step of introducing the device percutaneously through the skin prior to the advancing step.

20 31. A method of treating the spine as in Claim 26, wherein the further advancing step comprises advancing the device along a linear path through the spine.

32. A method of treating the spine as in Claim 26, wherein the further advancing step comprises advancing the device along a nonlinear path through the spine.

25 33. A method of treating the spine as in Claim 26, wherein the treating step comprises implanting a fixation device.

30 34. A method of treating the spine comprising creating a minimally invasive passageway through tissue and into the spine, wherein the passageway has a longitudinal axis and a length of at least about 5 times its width, and introducing at least one device through the passageway to treat the spine, wherein an extension of the axis extends through at least two intervertebral disks.

35. A method of treating the spine as in Claim 34, wherein the passageway has a length of at least about 10 times its width.

36. A method of treating the spine as in Claim 34, wherein the passageway passes through the skin within about 5 cm of the coccyx.

5 37. A method of treating the spine as in Claim 34, wherein the passageway enters the spine on the anterior side.

38. A method of treating the spine as in Claim 34, wherein the passageway enters the spine on the posterior side.

10 39. A method of treating the spine as in Claim 34, wherein the introducing step comprises introducing a fixation device.

40. A method of performing a procedure on the spine at a procedure site which is spaced apart from an access site, comprising the steps of:

15 identifying an access site on the spine;
advancing a device through the access site and into the spine;
further advancing the device axially through at least one vertebrae and at least one disk to the procedure site; and
performing a procedure at the procedure site;
wherein the access site is on a healthy portion of the spine, and the procedure site is on an unhealthy or compromised portion of the spine.

20 41. A method of performing a procedure as in Claim 40, wherein the access site is on a sacral vertebrae.

42. A method of performing a procedure as in Claim 40, wherein the procedure site is in a disk.

25 43. A method of performing a procedure from the inside of the spine, while minimizing the cross sectional area of an access pathway to the procedure site, comprising the steps of:

30 advancing a device through an access pathway in the spine to a procedure site, while the device has a first, reduced crossing profile; and
enlarging the crossing profile of a portion of the device at the treatment site to perform the procedure;

wherein the advancing step comprises advancing the device through at least one vertebrae and at least one disk.

44. A method of performing a procedure from the inside of the spine as in Claim 43, wherein the enlarging step comprises advancing a portion of the device radially outwardly from a longitudinal axis of the device, to perform the procedure.

45. A method of fusing the spine, comprising the steps of:
identifying a site on the anterior surface of the sacrum;
forming a lumen from the site through the sacrum, through a disk and into at least one vertebrae; and

introducing a fusion implant through the lumen.

46. A method of fusing the spine as in Claim 45, wherein the introducing step comprises introducing an elongate metal fusion device.

47. A method of fusing the spine as in Claim 45, wherein the introducing step comprises introducing a cure in place media.

48. A method of accessing the spine through a site on the anterior of the sacrum, comprising the steps of:

introducing an access device through a tissue tract from the surface of the skin to a first site on the anterior of the sacrum;

advancing the access device along the anterior surface of the sacrum to a second site; and

entering the sacrum at the second site.

49. A method of accessing the spine as in Claim 48, wherein the advancing step comprises advancing the distal end of the access device both distally and laterally as the distal end moves along the anterior surface of the sacrum.

50. A method of accessing the spine as in Claim 48, wherein the introducing step comprises introducing a blunt needle trocar.

51. A method of accessing the spine as in Claim 48, wherein the introducing step comprises introducing the access device through the paracoccygeal space.

52. A method of accessing the spine as in Claim 48, wherein the second site is anterior to S2.

53. A method of accessing the spine as in Claim 48, further comprising the step of positioning a tubular sheath through the tissue tract to the second site.

54. A method of accessing the spine as in Claim 53, further comprising the step of introducing a fixation device through the sheath.

5 55. A method of accessing the spine as in Claim 54, wherein the fixation device is positioned across at least the S1 and L5 vertebrae.

56. A method of accessing the spine as in Claim 55, wherein the fixation device is positioned across at least the S1, L5 and L4 vertebrae.

10 57. A method of positioning a linear access sheath from a paracoccygeal entrance point to the S2 vertebrae, comprising the steps of:

introducing an access device through tissue in the paracoccygeal space;

advancing the distal end of the access device into contact with the sacrum;

15 sweeping the distal end along the anterior surface of the sacrum towards the S2 vertebrae, thereby displacing anatomical structures from the path of the access device; and

fixing the distal end of the access device with respect to the S2 vertebrae.

58. A method of positioning a linear access sheath as in Claim 57, wherein the advancing step comprises advancing the sheath through an incision.

20 59. A method of positioning a linear access sheath as in Claim 57, wherein the advancing step comprises advancing the sheath through a percutaneous puncture.

60. A method of positioning a linear access sheath as in Claim 57, wherein the fixing step comprises threadably engaging the distal end of the sheath in an aperture in the S2.

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